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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,900	06/28/2006	Inga-Lill Solberg	19200-000055/US	6920

30593 7590 08/24/2010
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EXAMINER	
JIANG, YONG HANG	

ART UNIT	PAPER NUMBER
2612	

MAIL DATE	DELIVERY MODE
08/24/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/552,900	Applicant(s) SOLBERG ET AL.	
	Examiner YONG HANG JIANG	Art Unit 2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 10 June 2010.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-40 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-40 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant’s amendment filed 6/10/2010 has been entered. Claims 1-40 are amended and pending.

Response to Arguments

Applicant's arguments filed 6/10/2010 have been fully considered but they are not persuasive.

Applicant argues on the first paragraph of page 18 that nothing in Horwitz necessarily requires its radio frequency module 12 in tag reader 1 to include any digital circuitry and that Horwitz discloses only that its radio frequency module includes analog circuitry. The examiner respectfully disagrees. Col. 7, lines 40-44 as pointed out by the applicant states the air interface stage 31 and the data interface stage 32 comprise analogue circuitry. The word “comprise” does not preclude other circuitry such as digital circuitry from being included.

Applicant next argues that nothing necessarily requires reader 1 in Horwitz to include an analog to digital converter. The examiner respectfully disagrees. As is well known in the art, computer processors process data in the form of digits (1s and 0s; or high and low pulses, col. 10, lines 7-20). The RFID reader of Horwitz is no different; therefore, it requires a digital circuit such as the processor to process data in the form of digits (microprocessor in the data interface and protocols stage 34, col. 10, lines 21-35). The response signals from the RFID tags are wireless signals that must be first received by analog circuits (radio frequency module 12, Fig. 1) then converted to digits by an

analog to digital converter in order to extract and process the data received (via radio waves converted to pulse streams, Col. 10, lines 1-20). Horwitz does not explicitly state an analog to digital converter; instead, the analog to digital converter is depicted as a series of components that perform the functions of an analog to digital converter. Figures 4(a)-4(b) depict the series of components required to convert analog signals to digital signals for processing by a microprocessor (microprocessor in the data interface and protocols stage 34 processing digital signals in the form of pulses, See col. 9, line 16 to col. 10, line 35; with emphasis on col. 10, lines 21-26).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claim 1-5, 7-13, 16-18, 21-25, 27-33, and 36-38 rejected under 35 U.S.C. 102(e) as being anticipated by Horwitz et al. (US 6,617,962).

Regarding claim 1 and 21, Horwitz discloses a transponder reader and method for reading data from a plurality of transponders, the transponders sending data according to a plurality of transponder signaling protocols (via reader for tags operating multiple frequencies, Abstract), the transponder reader comprising:

an antenna configured to send a first analog signal to one of the transponders and to receive a second analog signal from the one transponder (via antenna 101 in air interface stage 31 for interrogating tags and receiving information from tags, Col. 9, lines 22-25 and Col. 6, lines 52-58);

a signal processor configured to analyze the second analog signal received by the antenna (via radio frequency module 12 comprising air interface 31 and data interface 32 configured to analyze the response signals received from tags, Col. 9, line 16 to Col. 10, line 20);

a digital processor (via programmed microprocessor interfaced to the data interface and protocols stage 34, Col. 7, lines 54-58), an analog to digital converter (components in Fig. 4a and 4b) configured to, receive the second analog signal from the antenna (via antenna 101, Fig. 4a), convert the second analog signal to a first digital signal (via logic level convertor 116, Fig. 4b), and transmit the first digital signal to the digital processor (via output port 118 outputting to bus 19, Col. 10, lines 14-20), the digital processor configured to identify, from the first digital signal, which transponder signaling protocol of the plurality of transponder signaling protocols was used to send the second analog signal (via the data interface and protocols stage 34 implemented as a field programmable gate array or FPGA will use different procedures for different tag types, Col. 8, lines 7-30).

Regarding claim 2 and 22, Horwitz discloses the signal processor is configured to demodulate, detect, and decode digital signals according to at least two different transponder signaling protocols (via the data interface and protocols stage 34

implemented as a field programmable gate array or FPGA will use different procedures for different tag types, Col. 8, lines 7-30).

Regarding claim 3 and 23, Horwitz discloses a transmitter configured to send the analyzed digital signal to a post processor (via output port 118 outputting to bus 19, Col. 10, lines 14-20).

Regarding claim 4 and 24, Horwitz discloses the antenna includes a digital interface configured to receive digital messages from the digital processor and transmit digital messages to the digital processor (via bus 19 transmit signals outputted by control module 11 to antenna, and bus 19 receive messages from tags, Fig. 1 and Col. 7, lines 54-58), the digital interface configured to control characteristics of the antenna based on the received digital messages (via bus 19 provides control signals to radio frequency modules 12 to 18, Col. 6, lines 52-58), and the antenna is configured to transmit digital messages relating to the antenna characteristics to the digital processor (via antenna receiving responses from tags and transmitting the responses to the control module 11 through bus 19, Col. 10, lines 14-20).

Regarding claim 5 and 25, Horwitz discloses the digital messages sent to the digital interface include antenna ready to send information (via operator initiating reader to send interrogation signals, the initiation command on the reader is equivalent to antenna ready to send, Col. 7, lines 58-63).

Regarding claim 7 and 27, Horwitz discloses the transponder reader further comprising: a digital to analog converter (via transmitter 104 to convert digital control signal received from control module 11 to analog interrogation signal sent to tags), the

digital processor configured to supply a second digital signal to the digital to analogue converter (via control signal to interrogate, Col. 6, lines 52-58), the digital to analog converter configured to convert the second digital signal to the first analog signal and transmit the first analogue signal to the antenna (via transmitter 104 to convert digital control signal received from control module 11 to analog interrogation signal sent to tags, See Col. 6, lines 52-58).

Regarding claim 8 and 28, Horwitz discloses the digital processor is configured to demodulate the first digital signal according to at least two different demodulation schemes (via data interface and protocols stage 34 handling of data protocols based on the tags types being controlled, See Col. 8, lines 1-18).

Regarding claim 9 and 29, Horwitz discloses the digital processor is configured to detect symbols from the demodulated digital signal according to at least two different symbol detection schemes (via data interface and protocols stage 34 handling of data protocols based on the tags types being controlled, Col. 8, lines 1-18).

Regarding claim 10 and 30, Horwitz discloses the digital processor is configured to decode the detected symbols according to at least two different symbol decoding schemes (via data interface and protocols stage 34 handling of data protocols based on the tags types being controlled, Col. 8, lines 1-18).

Regarding claim 11 and 31, Horwitz discloses the digital processor is configured to decode the detected symbols by performing an error detection check (via CRC check, See Col. 9, lines 6-9).

Regarding claim 12 and 32, Horwitz discloses the digital processor is configured to detect which of the two different demodulating, detection, and decoding schemes produce a highest signal detection quality, the digital processor configured to demodulate, detect, and decode according to the determined schemes (via interrogator control module 11 detecting which radio frequency module is receiving signals from tags, See Fig. 1).

Regarding claim 13 and 33, Horwitz discloses the digital processor is configured to receive an operator selection among the two different demodulating, detection, and decoding schemes, the digital processor configured to demodulate, detect, and decode according to the selection (via LCD touch panel 38 for accepting commands and displaying information concerning the operation of the radio frequency id system, Col. 7, lines 57-53).

Regarding claim 16 and 36, Horwitz discloses the antenna is configured to send further analog signals using the transponder signaling protocol used to send the second analog signal (via antenna coupled to transmitter 104 configured to send interrogation signals to tags, Col. 6, lines 52-58).

Regarding claim 17 and 37, Horwitz disclose the digital processor is configured to identify the transponder signaling protocol used to send the second analog signal in a start up sequence (via reader sending out interrogation signals to tags) and assume that all transponders are working according to the transponder signaling protocol used to send the second analog signal (via when the tags present responding with a fixed frequency band, and no other signals outside the fixed frequency are detected, See Fig.

1).

Regarding claim 18 and 38, Horwitz discloses the digital processor is configured to identify the transponder signaling protocol used to send the second analog signal based further on an operator selection of an appropriate transponder signaling protocol (via LCD touch panel 38 for accepting commands and displaying information concerning the operation of the radio frequency id system, Col. 7, lines 57-53).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claim 6 and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over Horwitz as applied to claim 1 and 21 above, and further in view of MacLellan (US 5,649,296).

Regarding claim 6 and 26, Horwitz discloses a half duplex protocol for tags operating at 458-917 MHz (See Col. 6, lines 12-13).

Horwitz did not specifically disclose a full duplex protocol for tags operating at other frequencies. MacLellan teaches a full duplex system to allow an interrogator and tag to transmit continuously during the same time period to achieve the advantage of ease of maintaining time slot synchronization. (See the Abstract; Col. 1, line 61 to Col. 2, line 10)

From the teachings of Horwitz, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transponder reader of Horwitz to include a full duplex protocol for tags operating at other frequencies as taught by MacLellan to achieve the advantage of ease of maintaining time slot synchronizations by using a full duplex protocol.

3. Claim 14 and 34 rejected under 35 U.S.C. 103(a) as being unpatentable over Horwitz as applied to claim 1 and 21 above, and further in view of MacLellan (US 5,649,296) and Kanemasa et al. (US 4,769,808).

Regarding claim 14 and 34, Horwitz did not specifically disclose the transponder signaling protocol used to send the second analog signal is a full duplex protocol.

MacLellan teaches a full duplex system to allow an interrogator and tag to transmit continuously during the same time period to achieve the advantage of ease of

maintaining time slot synchronization. (See the Abstract; Col. 1, line 61 to Col. 2, line 10)

From the teachings of MacLellan, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transponder reader of Horwitz to include the transponder signaling protocol used to send the second analog signal is a full duplex protocol as taught by MacLellan to achieve the advantage of ease of maintaining time slot synchronizations by using a full duplex protocol.

The combination of Horwitz and MacLellan did not specifically disclose a subtractor configured to subtract the first analog signal from the second analog signal so as to remove a contribution from the first analog signal from reception of the second analog signal.

Kanemasa teach that in order to reduce echo in a full duplex communication system, a first signal is subtracted from a received signal to remove the contribution from the first signal from the reception of the second signal. (See Col. 3, lines 44-54)

From the teachings of Kanemasa, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Horwitz and MacLellan to include a subtractor configured to subtract the first analog signal from the second analog signal so as to remove a contribution from the first analog signal from reception of the second analog signal as taught by Kanemasa to reduce unwanted contributions in the received signal, thereby improving signal quality.

4. Claim 15 and 35 rejected under 35 U.S.C. 103(a) as being unpatentable over Horwitz in view of MacLellan and Kanemasa as applied to claim 1, 14, 21, and 34 above, and further in view of Rodgers (US 6,831,562).

Regarding claim 15 and 35, the combination of Horwitz, MacLellan, and Kanemasa did not specifically disclose the subtractor is configured to boost the first analog signal before subtracting the first analog signal from the second analog signal.

Rodgers teaches using an amplifier to amplify signals received before providing the signals to detectors. (See Col. 43, line 63 to Col. 44, line 64). From the teachings of Rodgers, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Horwitz, MacLellan, and Kanemasa to include the subtractor is configured to boost the first analog signal before subtracting the first analog signal from the second analog signal as taught by Rodgers to improve the received signal quality before the signals are used, thereby improving performance of the system.

5. Claim 19 and 39 rejected under 35 U.S.C. 103(a) as being unpatentable over Horwitz as applied to claim 1, 4, 21, and 24 above, and further in view of Stilp (US 2004/0160324).

Regarding claim 19 and 39, Horwitz did not specifically disclose the digital interface is configured to set the antenna characteristics based on detected environmental characteristics so as to achieve optimal signaling detection quality in relation to the electromagnetic environment.

Stilp teaches a RFID reader that detects changes in the radio environment to make changes to the modulation scheme, power level, or other parameters of the reader to accommodate the changes detected. (See Col. 32, lines 18-22)

From the teachings of Stilp, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Horwitz to include the digital interface is configured to set the antenna characteristics based on detected environmental characteristics as taught by Stilp to change the modulation scheme, power level, or other parameters of the reader to accommodate the changes detected, thereby improving reader functionality.

6. Claim 20 and 40 rejected under 35 U.S.C. 103(a) as being unpatentable over Horwitz as applied to claim 9 and 24 above, and further in view of Murdoch (US 5,153,583).

Regarding claim 20 and 40, Horwitz did not specifically disclose a phase of the first analogue signal is controlled.

Murdoch teaches an interrogator with a stable master time reference source. The time reference source is used to operate the frequency (phase) of the powering field. A transponder's carrier oscillator may be phase coherently locked to the master time reference in the interrogator through the interrogator's powering field. Phase coherent locking of the signal carrier to the master time reference provides substantial advantages over non-coherent carrier generation. The carrier signal can be coherently detected at the interrogator using well understood coherent detection principles with the master time reference serving as the frequency reference to the coherent detection

circuits. Coherent detection provides optimum signal to noise detection, excellent interference suppression and sideband rejection (See Col. 14, lines 24-39).

From the teachings of Murdoch, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Horwitz to include the phase of said first analogue signal is controlled as taught by Murdoch to phase lock a transponder's carrier oscillator to the master time reference source in the reader, thereby providing optimum signal to noise detection.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YONG HANG JIANG whose telephone number is (571)270-3024. The examiner can normally be reached on M-F 9:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian A. Zimmerman can be reached on 571-272-3059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Y. J./
Examiner, Art Unit 2612

/Brian A Zimmerman/
Supervisory Patent Examiner, Art Unit 2612